

Application No. 10/697,193
Amendment and Response dated April 18, 2005
Reply to Office Action of April 1, 2005

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) An applicator for dispensing a coating material onto a substrate, the applicator comprising:
 - a body comprising
 - a distal end,
 - a liquid flow passage having a liquid inlet adapted to receive the coating material, and
 - a fluid passage having a fluid inlet adapted to receive a pressurized fluid;
 - a needle extending through the liquid flow passage;
 - a needle guide disposed near the distal end of the body and having inner surfaces that receive, align and laterally support the needle;
 - a nozzle disposed at the distal end of the body, the nozzle comprising a bore receiving the needle and a distal end extending beyond other structure of the applicator;
 - a seat disposed at the distal end of the nozzle;
 - a dispensing orifice extending through the seat, one end of the needle being movable into contact with the seat and through the dispensing orifice to terminate a flow of the coating material through the dispensing orifice and eliminate any coating material flow path downstream of the seat;
 - a cap disposed around the nozzle comprising a proximal end removably mounted to the body, and a distal end; and
 - a fluid path formed between the nozzle and the cap and contiguous with the fluid passage, the fluid path having a fluid outlet at the distal end of the cap.
2. (original) The applicator of claim 1 wherein the fluid outlet is an annular opening between the distal end of the cap and the nozzle.

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3. (original) The applicator of claim 1 wherein the distal end of the nozzle has a taper, and the distal end of the cap is tapered to conform with the taper of the distal end of the nozzle.
4. (original) The applicator of claim 1 wherein the body further comprises:
an extension comprising an internal passage contiguous with the liquid flow passage and receiving the needle therethrough, the cap being disposed around the extension and the fluid path being formed between cap and the extension, the needle guide being disposed in a bore in a distal end of the extension, and the nozzle being mounted on the distal end of the extension.
5. (original) The applicator of claim 1 wherein the needle remains disposed through the dispensing orifice when the needle is moved out of contact with the seat to permit the flow of coating material through the dispensing orifice.
6. (original) The applicator of claim 1 wherein the needle guide comprises axially extending liquid paths between the inner surfaces and contiguous with the internal passage to conduct the coating material between the internal channels and the needle.

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7. (original) An applicator for dispensing a coating material onto a substrate, the applicator comprising:

- a body comprising
 - a distal end,
 - a liquid flow passage having a liquid inlet adapted to receive the coating material, and
 - a fluid passage having a fluid inlet adapted to receive a pressurized fluid;
 - a needle extending through the liquid flow passage;
 - an extension comprising a longitudinal throughbore contiguous with the liquid flow passage and receiving the needle therethrough;
 - a needle guide disposed in the throughbore near a distal end of the extension and having inner surfaces that receive, align and laterally support the needle;
 - a nozzle disposed at the distal end of the extension, the nozzle comprising a bore receiving the needle and having a taper at a distal end extending beyond other structure of the applicator;
 - a seat disposed at the distal end of the nozzle;
 - a dispensing orifice extending through the seat, one end of the needle being movable into contact with the seat and through the dispensing orifice to terminate a flow of the coating material through the dispensing orifice and eliminate any coating material flow path downstream of the seat; and
 - a tubular cap disposed around the extension and the nozzle comprising a proximal end removably mounted to the body, and a distal end tapered to conform to the taper of the distal end of the nozzle, the cap forming with the extension and the nozzle a fluid path contiguous with the fluid passage, the fluid path having a fluid outlet at the distal end of the cap.

Claims 8-13 (canceled)

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14. (original) An applicator for dispensing a coating material onto a substrate, the applicator comprising:

a body comprising

a distal end,

a liquid flow passage having a liquid inlet adapted to receive the coating material, and

a fluid passage having a fluid inlet adapted to receive a pressurized fluid;

a needle extending through the liquid flow passage;

an extension comprising

a proximal end removably mounted to the body,

an internal passage contiguous with the liquid flow passage and receiving the needle, and

a distal end,

a nozzle disposed at the distal end of the extension, the nozzle comprising a bore receiving the needle and a distal;

a seat disposed in the distal end of the nozzle;

a dispensing orifice extending through the seat, the needle being movable into contact with, and away from, the seat;

a tubular cap disposed around the extension and the nozzle comprising

a proximal end removably mounted to the body,

a distal end,

the cap forming a fluid path with the extension and the nozzle, the fluid path being contiguous with the fluid passage;

an upper alignment guide disposed in the fluid path near the proximal ends of the extension and the cap, the upper alignment guide coaxially aligning the proximal ends of the extension and the cap; and

a lower alignment guide disposed in the fluid path near the distal ends of the extension and the cap, the lower alignment guide coaxially aligning the distal ends of the extension and the cap.

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15. (original) The applicator of Claim 14 wherein the fluid path between the extension and the cap is annular and unobstructed between the upper alignment guide and the lower alignment guide.
16. (original) The applicator of claim 15 wherein the upper alignment guide comprises upper splines extending from one of the extension and the cap, and the lower alignment guide comprises lower splines extending from one of the extension and the cap.
17. (original) The applicator of claim 16 wherein the upper splines extend inward from an inner surface of the cap.
18. (original) The applicator of claim 16 wherein the lower splines extend outward from an outer surface of the extension.
19. (original) The applicator of claim 18 further comprising:
 - upper spaces extending between the upper splines, the upper spaces conducting the pressurized fluid; and
 - lower spaces extending between the lower splines, the lower spaces conducting the pressurized fluid.
20. (original) The applicator of claim 19 wherein the lower spaces comprise respective lengths substantially parallel to a longitudinal centerline of the extension.
21. (original) The applicator of claim 19 wherein the lower spaces comprise respective lengths oblique to a longitudinal centerline of the extension.
22. (original) The applicator of claim 14 further comprising a needle guide removably mounted in the liquid flow passage near the distal end of the extension and having

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inner surfaces laterally supporting the needle in a coaxial relationship with the extension.

23. (original) An applicator for dispensing a coating material onto a substrate, the applicator comprising:

- a body comprising
 - a distal end,
 - a liquid flow passage having a liquid inlet adapted to receive the coating material, and
 - a fluid passage having a fluid inlet adapted to receive a pressurized fluid;
- a needle extending through the liquid flow passage;
- an extension comprising
 - a proximal end removably mounted to the body,
 - an internal passage contiguous with the liquid flow passage and receiving the needle,
 - a distal end, and
 - lower splines extending outward from an outer surface of the extension at its distal end;
 - a nozzle disposed at the distal end of the extension, the nozzle comprising a bore receiving the needle and a distal;
 - a seat disposed in the distal end of the nozzle;
 - a dispensing orifice extending through the seat, the needle being movable into contact with, and away from, the seat; and
 - a tubular cap disposed around the extension and the nozzle comprising
 - a proximal end removably mounted to the body,
 - upper splines extending inward from an inner surface at the proximal end of the cap, the upper splines coaxially aligning the respective proximal ends of the extension and the cap,

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a distal end, the distal end of the cap being coaxially aligned with the distal end of the extension by the lower splines,

the cap forming a fluid path with the extension and the nozzle, the fluid path being contiguous with the fluid passage.

24. (original) An applicator for dispensing a coating material onto a substrate, the applicator having a body with a liquid flow passage for receiving the coating material and a fluid passage for receiving a pressurized fluid, a dispensing valve disposed in a distal end of the body, and a cap disposed around the body and forming a fluid path conducting the pressurized fluid, the applicator comprising:

a nozzle comprising
a proximal end adapted to be mounted to a distal end of the body and received within the air cap,
a centerbore adapted to receive the dispensing valve,
a distal end,
a dispensing orifice extending through the distal end, and
a tapered downstream end having an outer surface polished smooth and coated with material that inhibits an accumulation and adhesion of the coating material.

25. (original) The applicator of claim 24 wherein the applicator has a needle with a tapered distal end and the centerbore of the nozzle comprises a downstream end with a taper generally conforming to the tapered distal end of the needle so that the tapered distal end of the needle is extendable through the dispensing orifice.

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26. (original) An applicator for dispensing a coating material onto a substrate, the applicator having a liquid flow passage for receiving the coating material and a fluid passage for receiving a pressurized fluid, a nozzle is mounted at a distal end of the body, and a dispensing valve is disposed in the nozzle, the air cap comprising:

a tubular body disposed around the nozzle and comprising

a proximal end removably mounted to the body,

an alignment guide disposed at the proximal end of the cap for coaxially aligning the cap with the body, the cap forming a fluid path with the nozzle contiguous with the fluid passage, and

a distal end forming a fluid outlet with nozzle.

27. (original) The applicator of claim 26 wherein the alignment guide comprises a plurality of radially directed splines extending from an inner surface of the cap, the splines being separated by spaces adapted to conduct the pressurized fluid between the splines.

28. (original) The applicator of claim 26 wherein the fluid outlet is a circular opening at the distal end of the cap.

29. (original) The applicator of claim 26 wherein the distal end of the nozzle comprises a taper and the distal end of the cap is tapered to conform to the taper on the nozzle.

30. (original) The applicator of claim 26 wherein the proximal end of the cap comprises a flange for mounting the cap to the body.

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31. (original) An applicator for dispensing a coating material onto a substrate, the applicator having a body with a liquid flow passage for receiving the coating material and a fluid passage for receiving a pressurized fluid, a nozzle having a dispensing valve disposed therein, and a cap disposed around the nozzle and forming a fluid path conducting the pressurized fluid, the applicator further comprising:

a tubular extension comprising

a proximal end adapted to be removably mounted to the body,

a distal end,

an alignment guide disposed at the distal end of the extension and adapted to coaxially align the extension with the cap, the extension having an inner bore adapted to be contiguous with the liquid flow passage and conduct the coating material through the extension.

32. (original) The applicator of Claim 31 wherein the extension comprises a plurality of splines extending from an outer surface of the extension, the splines being separated by spaces adapted to conduct the pressurized fluid between the splines.

33. (original) The applicator of claim 32 wherein the splines comprise respective lengths extending substantially parallel to a centerline of the extension.

34. (original) The applicator of claim 32 wherein the splines comprise respective lengths extending oblique to a centerline of the extension.

35. (original) The applicator of claim 32 wherein the proximal end of the extension comprises external threads for mounting the extension to the body.

36. (original) The applicator of claim 35 wherein the distal end of the extension comprises internal threads for mounting the nozzle to the extension.

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37. (original) The applicator of claim 36 wherein the external threads have a pitch substantially equal to a pitch of the internal threads.

38. (original) An apparatus for dispensing a coating material onto a substrate, the apparatus comprising:

- a body comprising
- a liquid flow passage having a liquid inlet adapted to receive the coating material,
- a fluid passage comprising a fluid inlet adapted to receive a pressurized fluid, and
- a fluid outlet discharging the pressurized fluid at a distal end of the body;
- a nozzle mounted in the distal end of the body, the nozzle having a tapered distal end;
- a dispensing valve disposed in the nozzle; and
- a cap disposed around the nozzle comprising
- a proximal end removably mounted to the body,
- a distal end tapered to conform with the tapered distal end of the nozzle, and
- the cap and nozzle forming a fluid path therebetween contiguous with the fluid passage.

39. (original) The apparatus of claim 38 further comprising a fluid outlet formed between the distal end of the cap and the nozzle.

40. (original) The apparatus of claim 38 wherein the tapered distal end of the nozzle extends further downstream than any other portion of the applicator.

Claims 41-49 (canceled)